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A new species of *Dactylolabis* subgenus *Dactylolabis* Osten Sacken, 1860 from China (Diptera, Limoniidae)

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Abstract

Only two species of *Dactylolabis* subgenus *Dactylolabis* Osten Sacken, 1860 were previously known from China. Here, a new species, *Dactylolabis* (*Dactylolabis*) *wudangensis* **sp. nov.**, is reported from China. *Dactylolabis* (*D.*) *gracilistylus* Alexander, 1926 is re-described and illustrated. A key to males of species of the subgenus *Dactylolabis* from China is presented.

Keywords

Biodiversity, crane flies, Dactylolabinae, key, taxonomy

Introduction

Dactylolabis subgenus *Dactylolabis* Osten Sacken, 1860 (Diptera, Limoniidae) is a large subgenus in the subfamily Dactylolabinae. It is distributed worldwide with 50 known species, of which 32 taxa are from the Palaearctic Region, including 16 from Europe, and 18 from the Nearctic Region (Oosterbroek 2021). The subgenus is characterized by the following features: antennae 16-segmented; vein *MA* missing; crossvein *m-cu* near base of cell *dm*; outer gonostylus fleshy with many setae; cerci of ovipositor with wide apex (Osten Sacken 1860; Savchenko 1978; Alexander and Byers 1981; Starý 1992; Podenas et al. 2006; Ribeiro 2008).

* These authors contributed equally to this work.

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Materials and methods

The specimens were studied and illustrated with a ZEISS Stemi 2000-c stereomicroscope. Details of the coloration were checked in specimens immersed in 75% ethyl alcohol (C_2H_5OH). Genitalic preparations of males were made by macerating the apical portion of the abdomen in cold 10% NaOH for 12–15 hours. After examination, the genitalia were transferred to fresh glycerine ($C_3H_8O_3$) and stored in a microvial pinned below the specimen. Type specimens of the new species are deposited in the Entomological Museum of China Agricultural University, Beijing, China (**CAU**). The holotype of *D.* (*D.*) *mokanica* Alexander, 1940 was borrowed from the Institute of Zoology, China Academy of Sciences, Beijing, China (**IZCAS**).

The morphological terminology mainly follows McAlpine (1981), Alexander and Byers (1981), and Savchenko (1978). The terminology applied to the wing veins follows the interpretations of Savchenko (1978) and de Jong (2017). Terminology of the male hypopygium follows Savchenko (1978) and Alexander and Byers (1981). The following abbreviations are used: og = outer gonostylus, ig = inner gonostylus, aed = aedeagus, gx = gonocoxite, 9t = ninth tergite, 9s = ninth sternite.

Taxonomy

A key to adult males of the subgenus *Dactylolabis* from China

1 Wing yellowish hyaline throughout, except pterostigma (Figs 1, 3); vein R_4 relatively straight at tip (Figs 1, 3; Alexander 1926: pl. 1, fig. 8) ..... ***Dactylolabis* (*Dactylolabis*) *gracilistylus* Alexander, 1926**

– Wing yellowish hyaline with brownish markings, except pterostigma (Figs 10, 11, 17); vein R_4 relatively curved at tip (Figs 10, 11, 17; Alexander 1940: p. 22, fig. 12) **2**

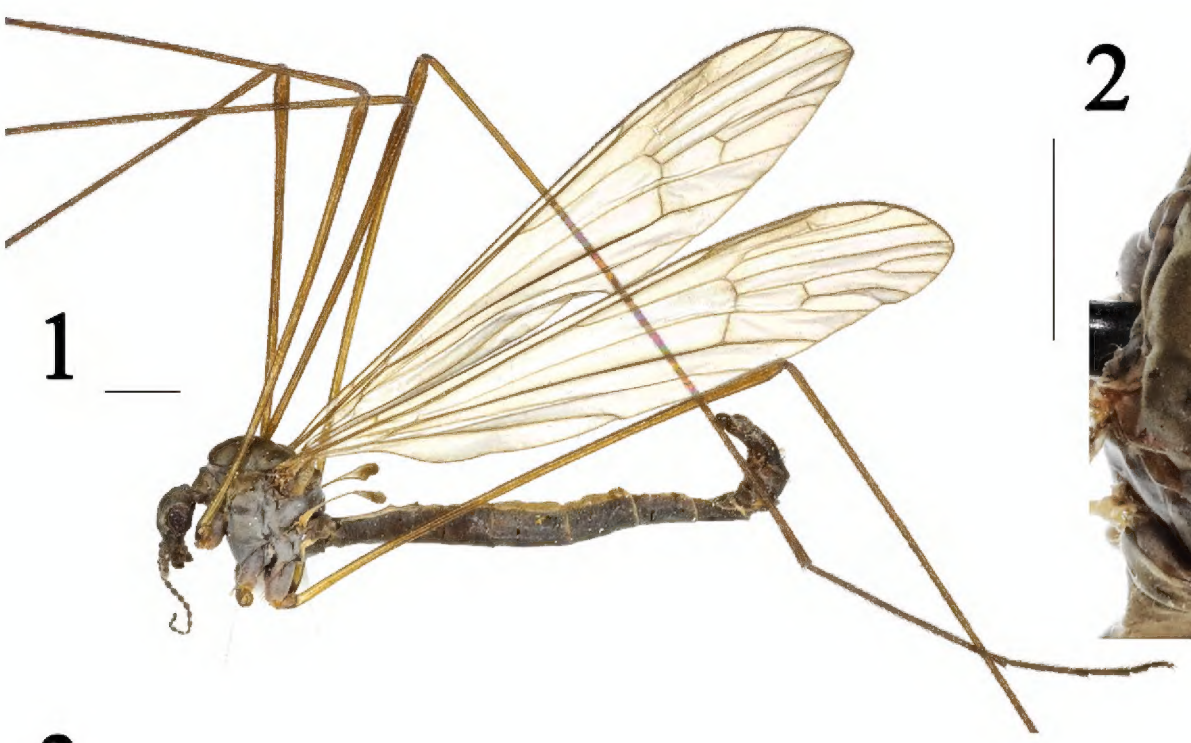
2 Cell r_1 not broad at pterostigma; crossvein *sc-r* shorter than vein R_1; crossvein *m-cu* near 1/3 of cell dm (Fig. 10; Alexander 1940: p. 22, fig. 12); tips of veins A_1 and *CuP* with brownish markings (Fig. 10) ..... ***Dactylolabis* (*Dactylolabis*) *mokanica* Alexander, 1940**

– Cell r_1 rather broad at pterostigma; crossvein *sc-r* longer than vein R_1; crossvein *m-cu* near 1/5 of cell *dm*; tips of veins A_1 and *CuP* without brownish markings (Figs 11, 17) ..... ***Dactylolabis* (*Dactylolabis*) *wudangensis* sp. nov.**

Dactylolabis (*Dactylolabis*) *gracilistylus* Alexander, 1926

Figs 1–7

Dactylolabis gracilistylus Alexander, 1926: 372. Type locality: China: Zhejiang.



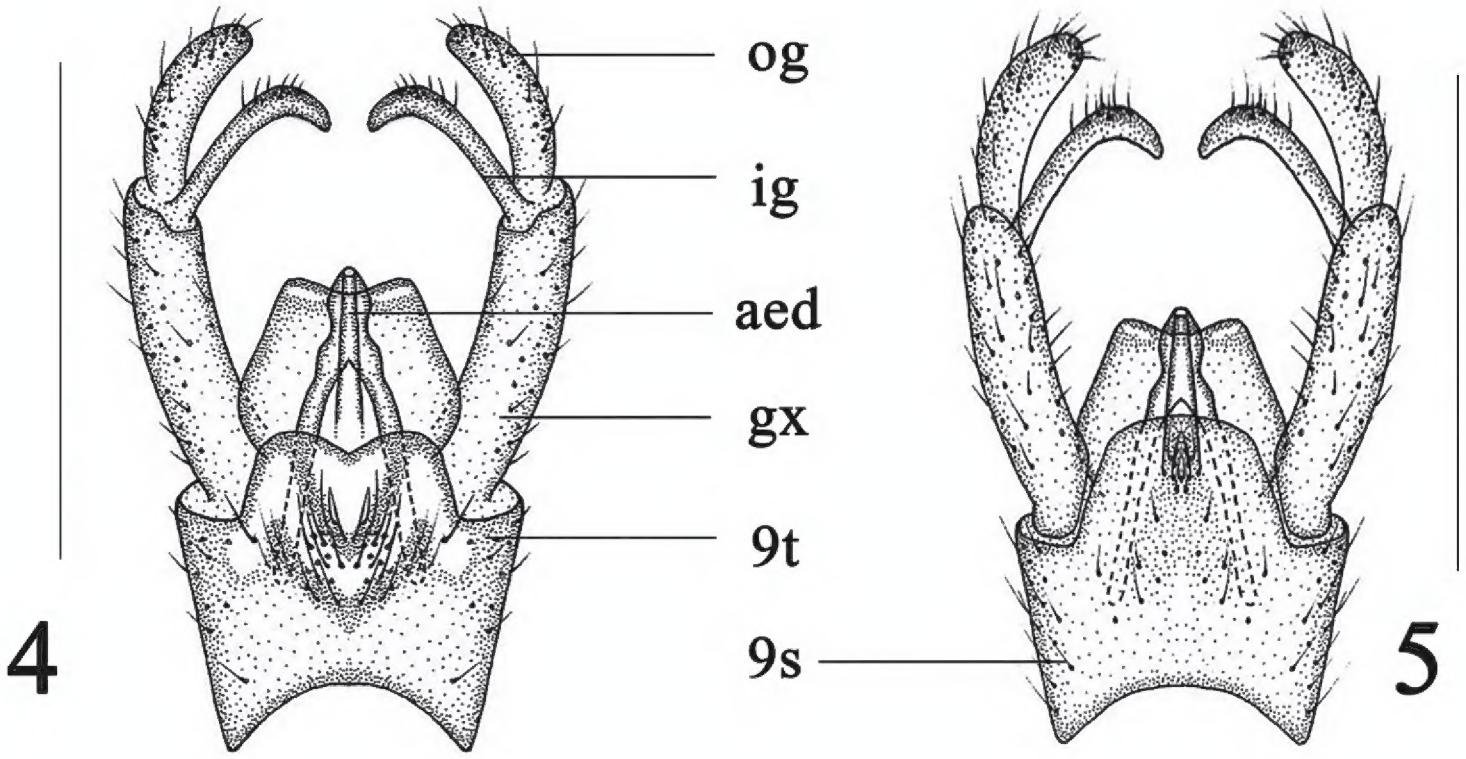
Figures 1–3. *Dactylolabis* (*Dactylolabis*) *gracilistylus* Alexander, 1926, male **1** habitus, lateral view **2** head and thorax, dorsal view **3** right wing. Scale bars: 1 mm.

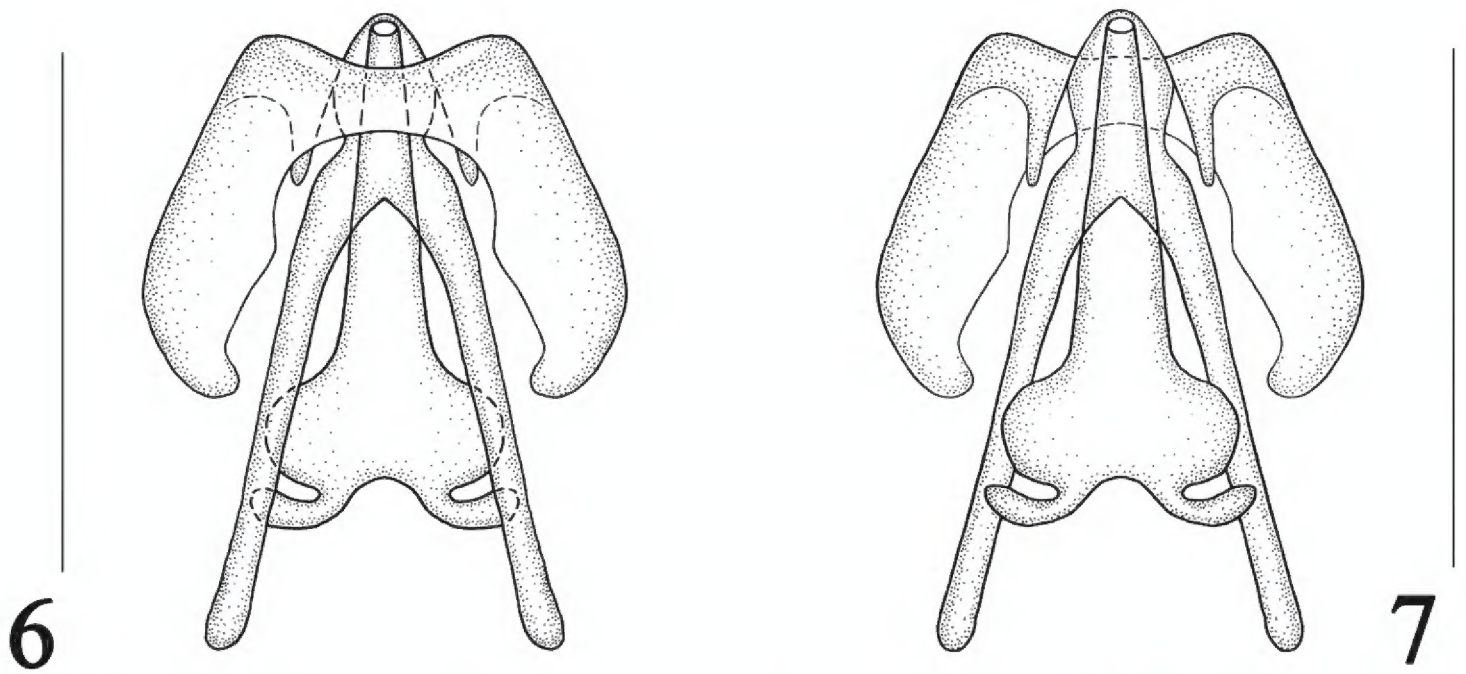
Diagnosis. Wing yellowish hyaline, pterostigma brownish. Vein R_3 as long as vein R_{2+3}. Veins R_4 and R_5 relatively straight. Vein M_1 as long as vein M_{1+2}. Crossvein *m-cu* located before or near base of cell *dm*. Posterior margin of 9t with an M-shaped process and a shallow V-shaped notch at middle. Inner gonostylus slender, curved; gonocoxite very elongate and slender, more than twice as long as outer gonostylus. Aedeagus very big, with a shallow V-shaped notch at posterior margin.

Redescription. Male (n = 3). Body length 8.2–8.5 mm, wing length 8.4–8.8 mm, antenna length 1.6–1.7 mm.

Head (Figs 1, 2) dark brown with pale gray pollen. Vertex with long setae. Rostrum and palpus brown. Antenna brown.

Thorax (Figs 1, 2) mostly dark brown with gray pollen. Pronotum rather long; mesonotum brownish, prescutum dark brown with pale gray pollen. Thoracic pleuron mostly dark brown with dense gray pollen. Legs: coxae brown with gray pollen; trochanters brownish-yellow; femora more yellow at base, brownish-yellow at tip; tibiae brownish-yellow; tarsi brown. Wing (Figs 1, 3) yellowish hyaline, pterostigma more brownish; veins brownish. Venation: *Rs* long; R_2 relatively oblique; R_3 as long as R_{2+3}; R_4





Figures 4–7. *Dactylolabis* (*Dactylolabis*) *gracilistylus* Alexander, 1926, male **4** hypopygium, dorsal view **5** hypopygium, ventral view **6** aedeagal complex, dorsal view **7** aedeagal complex, ventral view. Scale bars: 1 mm (**4, 5**); 0.5 mm (**6, 7**).

and R_5 relatively straight; M_1 as long as M_{1+2}; *m-cu* located before or near base of cell *dm*. Halter (Fig. 1) length approximately 1.3 mm, halter stem yellowish; halter brownish.

Abdomen (Fig. 1) elongated, tergites brownish-yellow, sternites dark brown.

Hypopygium (Figs 1, 4–7) dark brown with brownish setae. Surface of 9t with plenty of long setae, posterior margin with an M-shaped process, medially with a shallow V-shaped notch; posterior margin of 9s with plenty of long setae; outer gonostylus cylindrical; inner gonostylus slender, curved; gonocoxite very elongate and slender, more than twice as long as outer gonostylus; aedeagus hyaline, very big, posterior margin with a shallow V-shaped notch.

Female. Similar to male (Alexander 1926: 372).

Material examined. 1 male (CAU), China: Zhejiang, Yuyao, Siming Mountain, 1980.IV.27, Jikun Yang. 1 male (CAU), China: Zhejiang, Qingyuan, Baishanzu, 1984.IV.19, Hong Wu. 1 male (CAU), China: Zhejiang, Deqing, Mogan Mountain, 1991.IV.20.

Distribution. China (Zhejiang).

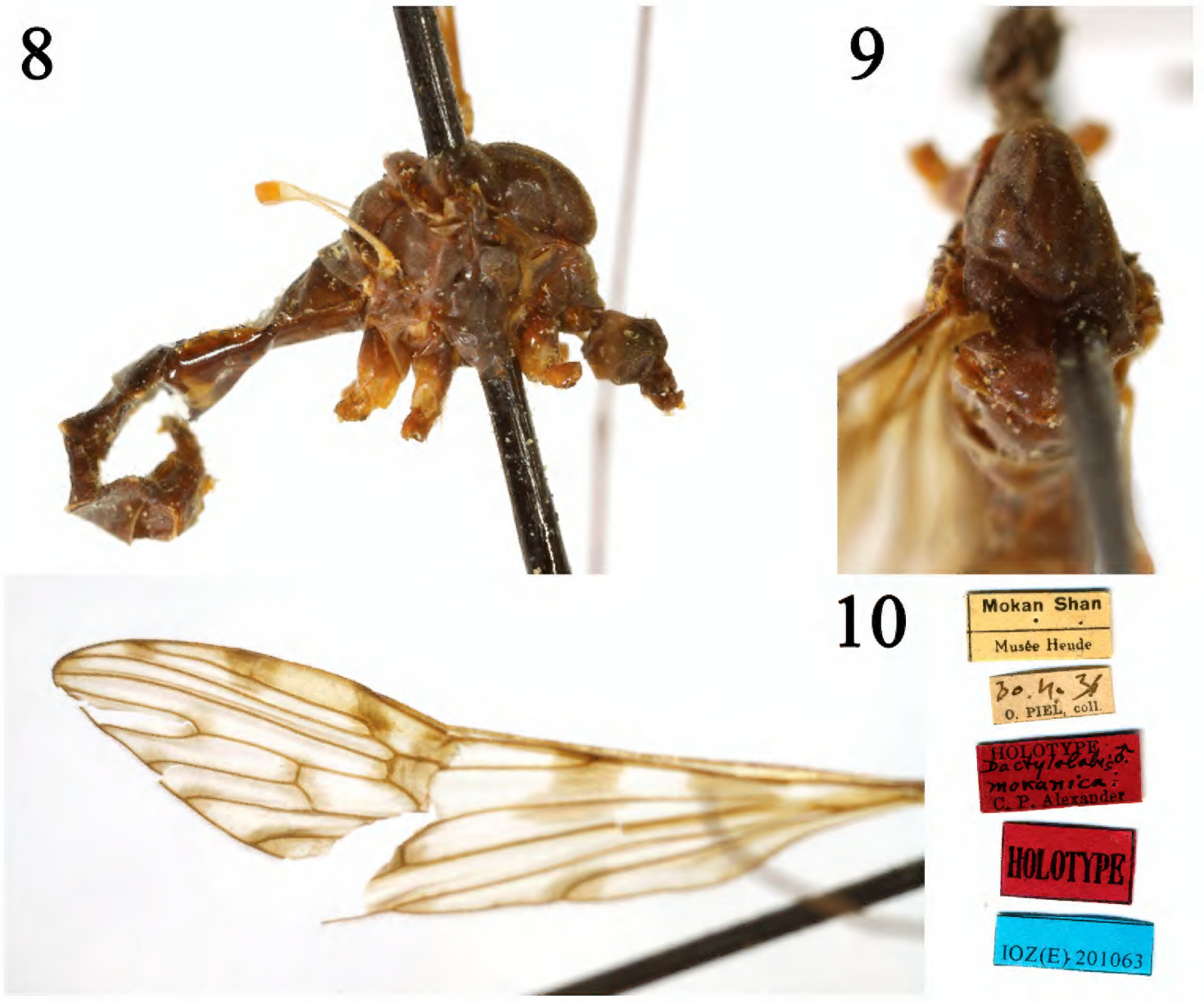
Dactylolabis (*Dactylolabis*) *mokanica* Alexander, 1940

Figs 8–10

Dactylolabis mokanica Alexander, 1940: 22. Type locality: China: Zhejiang: Mogan Mountain.

Diagnosis. Tips of veins A_1 and *Cup* with brownish markings. Vein R_3 as long as vein R_{2+3}. Vein R_4 relatively curved at tip. Vein M_1 about twice as long as vein M_{1+2}. Cross-vein *m-cu* located at basal 1/3 of cell *dm.*

Distribution. China (Zhejiang).



Figures 8–10. *Dactylolabis* (*Dactylolabis*) *mokanica* Alexander, 1940, male **8** habitus, lateral view **9** head and thorax, dorsal view **10** left wing.

Material examined. ***Holotype***, male, China: "Chekiang: Mokan Shan" (= Zhejiang: Mogan Mountain), April 30, 1936, Institute of Zoology, China Academy of Sciences, accession no. IOZ(E) 201063 (IZCAS).

***Dactylolabis* (*Dactylolabis*) *wudangensis* sp. nov.**
http://zoobank.org/8882A009-75B2-4B7D-B5F6-B0A935B1CA4C
Figs 11–21

Diagnosis. Cell r_1 relatively broad at pterostigma. Vein R_3 shorter than vein R_{2+3}. Vein R_4 relatively curved at tip. Vein M_1 about twice as long as vein M_{1+2}. Crossvein *m-cu* located at 1/5 of cell *dm*. Posterior margin of 9t with an M-shaped process and a deep V-shaped notch at middle. Inner gonostylus stubbier than outer gonostylus, curved. Gonocoxite rather short, as long as outer gonostylus. Aedeagus very big, with an elongated tip at posterior margin.

Description. Male (n = 3). Body length 7.2–10.1 mm, wing length 14.2–18.8 mm, antenna length 2.2–2.4 mm.

Head (Figs 11, 12) dark brown with gray pollen. Rostrum and palpus brown. Antenna brown.

Thorax (Figs 11, 12) mostly dark brown with gray pollen. Pronotum rather long; mesonotum brownish, prescutum brown with four dark brown stripes. Thoracic pleuron mostly dark brown with pale gray pollen. Legs: base of coxae brown, tip of coxae and trochanters brownish-yellow; femora more yellow at base, brown at tip; tibiae and tarsi brown. Wing (Figs 11, 17) yellowish hyaline, pterostigma more brownish, and with brownish markings near base of wing, origin of *Rs*, around crossvein *sc-r* and vein R_2, base of vein R_4, crossveins *r-m* and *m-m*, crossvein *m-cu*, and vein *CuA*; veins brown. Venation: cell r_1 relatively broad at pterostigma; *Rs* long; R_2 relatively straight; R_3 shorter than R_{2+3}; R_4 relatively curved at tip; R_5 relatively straight; M_1 about twice as long as M_{1+2}; *m-cu* located at 1/5 of cell *dm*. Halter (Figs 11, 12) approximately 2.2 mm long, stem yellowish, rest gray.

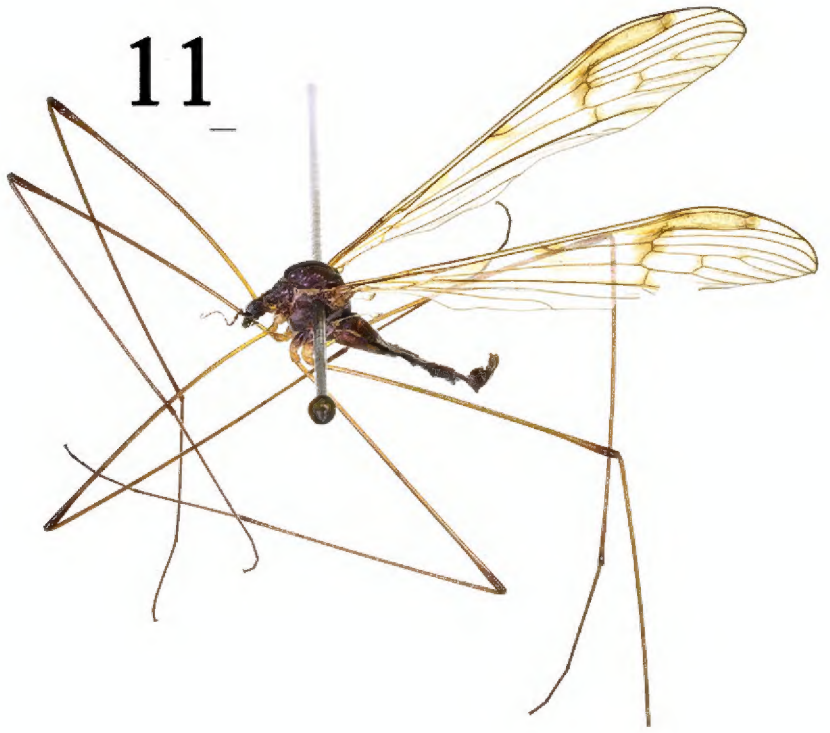
Abdomen (Fig. 11) mostly dark brown with brownish-yellow setae.

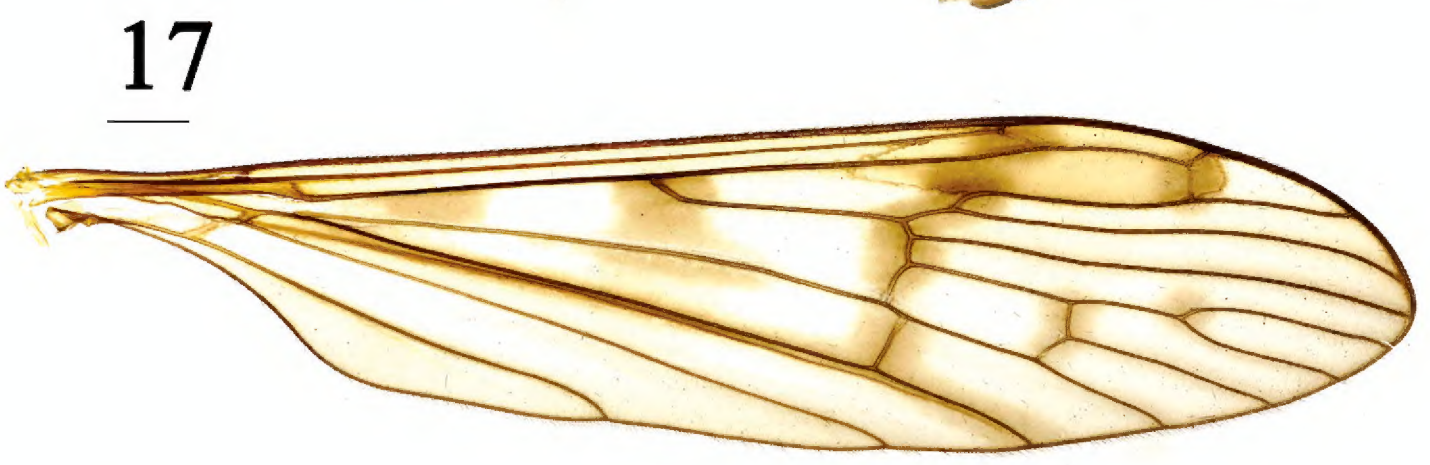
Hypopygium (Figs 11, 18–21) brown with brownish setae. Surface of 9t with numerous long setae, posterior margin with an M-shaped process, with a deep V-shaped notch at middle; outer gonostylus cylindrical; inner gonostylus stubby, curved; gonocoxite rather short, as long as outer gonostylus; aedeagus hyaline, very big, with an elongated tip at posterior margin.

Female (n = 1). Similar to male. Body length 8.6 mm, wing length 13.5 mm, antenna length 2.3 mm.

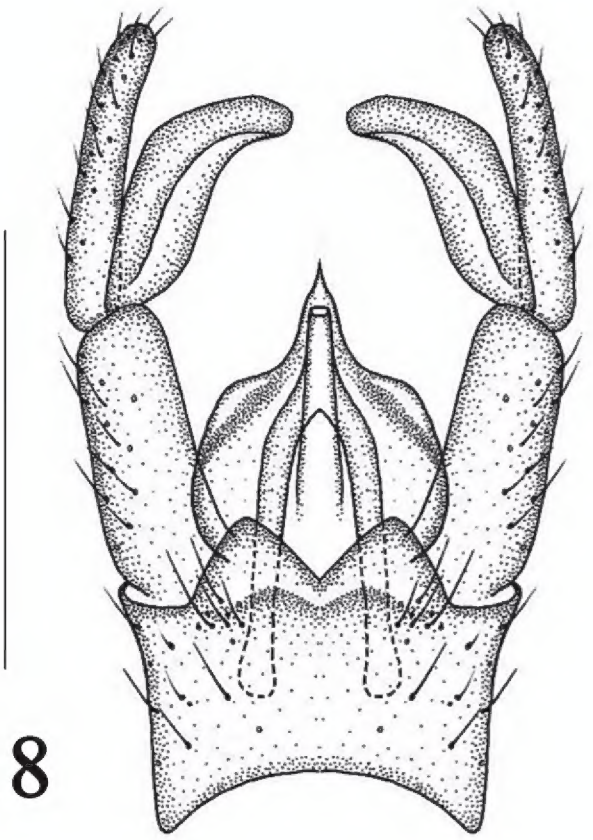
Ovipositor (Figs 13–16) brown with yellow setae. Cercus reddish-brown, broadened at base. Hypogynial valve yellow, narrowed toward tip, longer than cercus.

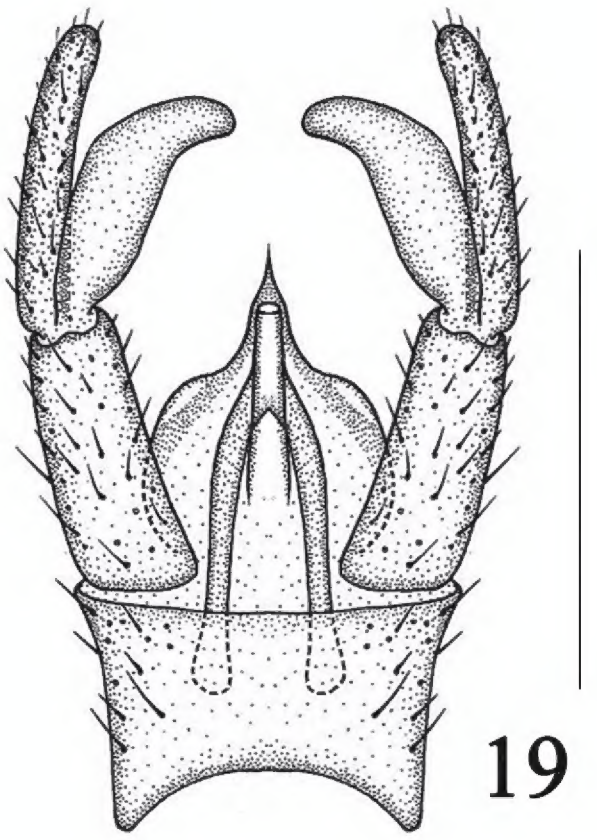
Type material. ***Holotype*****:** male (CAU), China: Hubei, Danjiangkou, Wudang Mountain, 1600 m, 1984.VI.31, Jikun Yang. ***Paratypes*****:** 2 males, 1 female (CAU), China: Hubei, Danjiangkou, Wudang Mountain, 1600 m, 1984.VI.31, Jikun Yang.

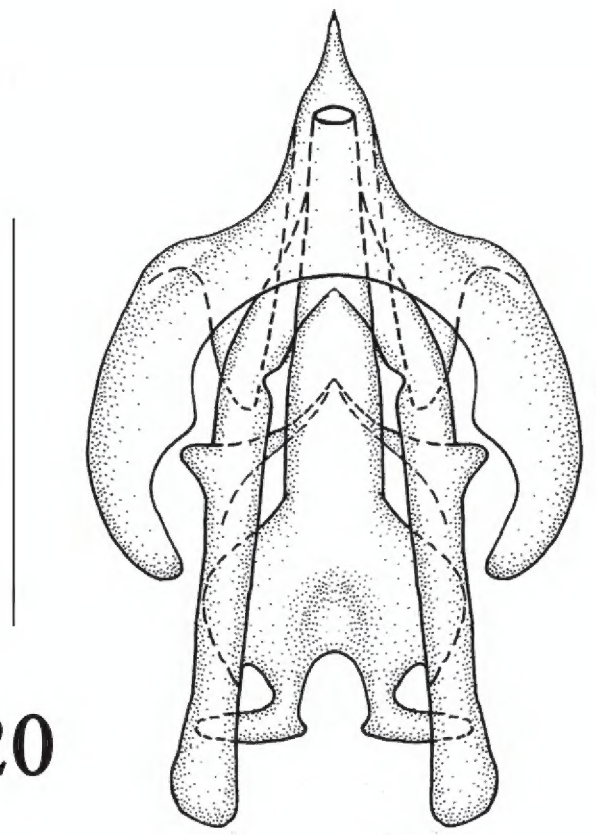


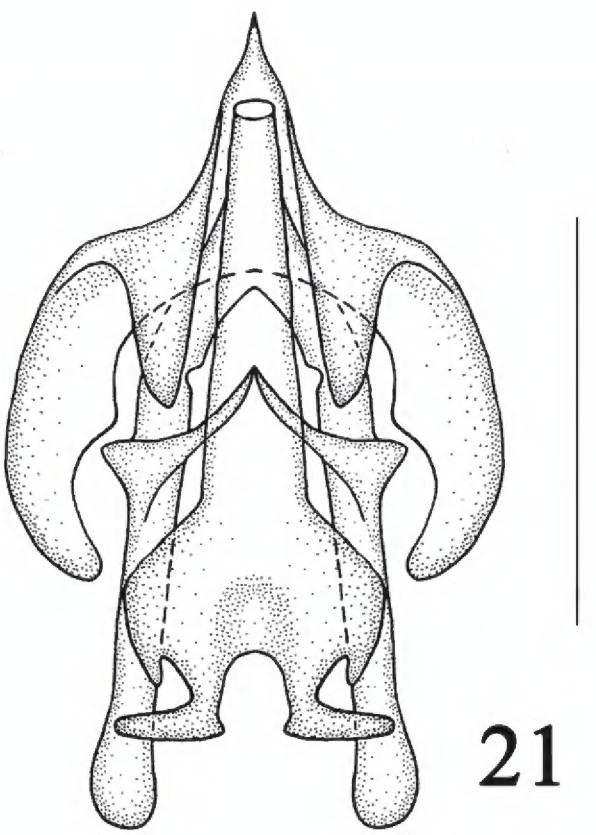


Figures 11–17. *Dactylolabis* (*Dactylolabis*) *wudangensis* sp. nov. **11** male habitus, lateral view **12** male head and thorax, dorsal view **13** female habitus, lateral view **14** ovipositor, dorsal view **15** ovipositor, lateral view **16** ovipositor, ventral view **17** male right wing. Scale bars: 1 mm.









Figures 18–21. *Dactylolabis* (*Dactylolabis*) *wudangensis* sp. nov., male **18** hypopygium, dorsal view **19** hypopygium, ventral view **20** aedeagal complex, dorsal view **21** aedeagal complex, ventral view. Scale bars: 1 mm (**18, 19**); 0.5 mm (**20, 21**).

Distribution. China (Hubei).

Etymology. The species is named after the type locality, Wudang Mountain.

Remarks. The new species is somewhat similar to *D.* (*D.*) *mokanica* Alexander, 1940 from China (Zhejiang), but can be separated from the latter by crossvein *sc-r*

slightly longer than crossvein R_1, *m-cu* located at 1/5 of cell *dm*, and tips of veins A_1 and *CuA* without brownish markings (Figs 11, 17). In *D.* (*D.*) *mokanica*, crossvein *sc-r* is shorter than vein R_1, crossvein *m-cu* is located at 1/3 of cell *dm*, and the tips of veins A_1 and *CuA* have brownish markings (Fig. 10; Alexander 1940: p. 22, fig. 12). The new species is somewhat similar to *D.* (*D.*) *dilatata* (Loew, 1856) from the West Palearctic and *D.* (*D.*) *subdilatata* Starý, 1969 from Czechia in having similar wing markings and venation, but can be separated from the latter two species by posterior margin of 9t with an M-shaped process and cercus shorter than hypogynial valve (Figs 13–16, 18, 19). In *D.* (*D.*) *dilatata* and *D.* (*D.*) *subdilatata*, the posterior margin of 9t lacks an M-shaped process and the cercus is longer than the hypogynial valve (Stary 1969: p. 125, figs 1, 4, 5, 8). The new species is somewhat similar to *D.* (*D.*) *dilatatoides* Savchenko, 1978 from Kazakhstan in having similar wing markings, but can be separated from the latter by vein R_{2+3+4} as long as vein R_2, and posterior margin of 9t with an M-shaped process (Figs 11, 17–19). In *D.* (*D.*) *dilatatoides*, vein R_{2+3+4} is almost absent and the posterior margin of 9t has a deep V-shaped notch (Savchenko 1978: p. 1176, fig. 1; p. 1177, fig. 3). The new species is somewhat similar to *D.* (*D.*) *laticellula* Savchenko, 1978 from Russia in having similar wing venation, but can be separated from the latter by wing with brownish markings and posterior margin of 9t with an M-shaped process (Figs 11, 17–19). In *D.* (*D.*) *laticellula*, the wing has no markings and the posterior margin of 9t lacks an M-shaped process (Savchenko 1978: p. 1176, fig. 2; p. 1177, fig. 4).

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